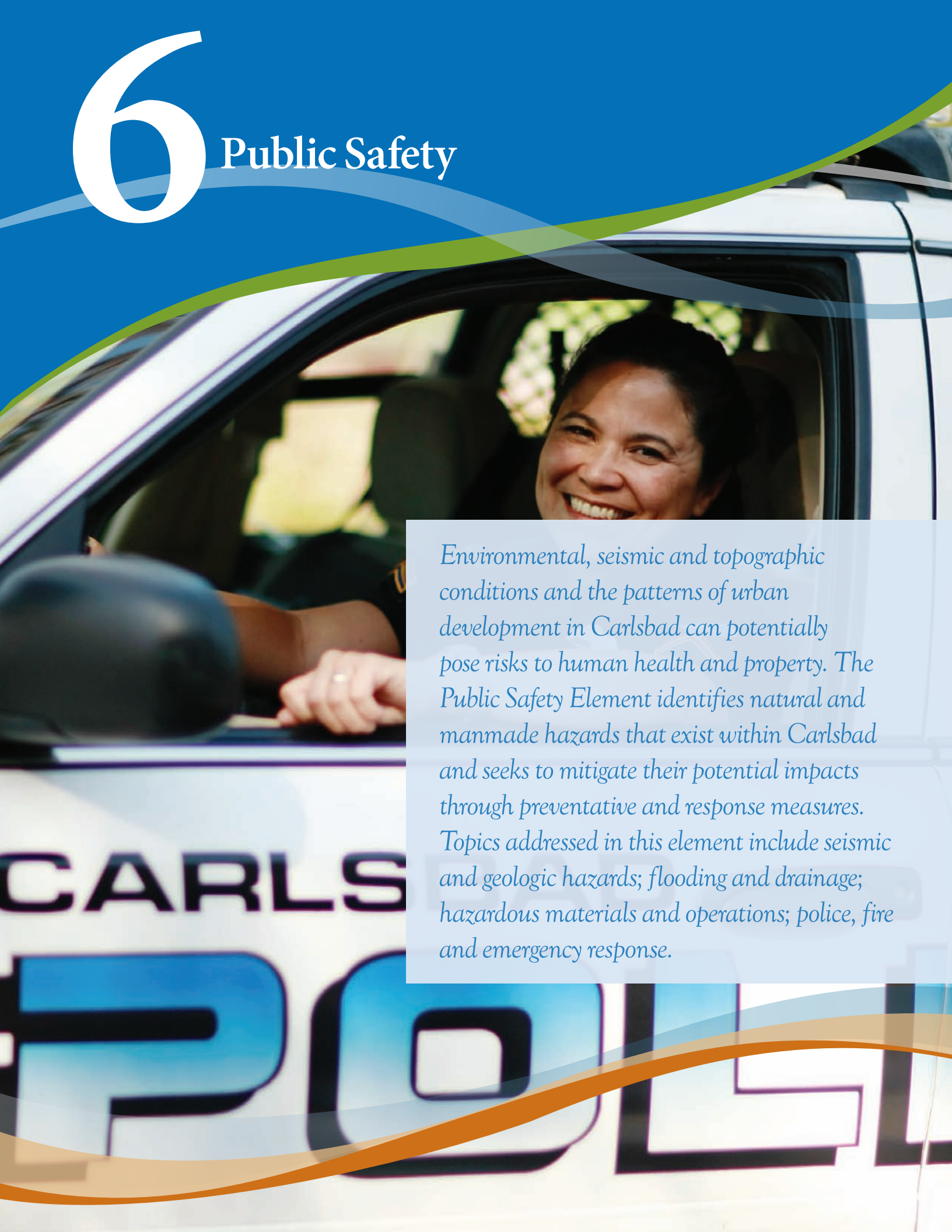
6 Public Safety



Environmental, seismic and topographic conditions and the patterns of urban development in Carlsbad can potentially pose risks to human health and property. The Public Safety Element identifies natural and manmade hazards that exist within Carlsbad and seeks to mitigate their potential impacts through preventative and response measures. Topics addressed in this element include seismic and geologic hazards; flooding and drainage; hazardous materials and operations; police, fire and emergency response.

6.1 Introduction

Background and Purpose

The purpose of this element is to acknowledge the risk posed by hazards, and to reduce the risk of injury, loss of life, property damage, and economic and social dislocation resulting from natural and manmade hazards. The proposed overall development pattern in the Land Use and Community Design Element incorporates consideration of flooding risk, seismic safety and other hazards. The Public Safety Element contains the city's goals and policies to reduce the risks associated with identified hazards and integrate mitigating measures into the city's development process.

Relationship to State Law

Government Code Section 65302(g) requires each California city and county to include within its general plan a public safety element that addresses the protection of the community from any unreasonable risks associated with the effects of seismic and other geologically-induced hazards, flooding, and fires. The Public Safety Element is required to include mapping of known seismic and other geological hazards. Where applicable, it must also address evacuation routes, peak load water supply requirements, minimum road widths and clearances around structures.

State law also allows cities to address any other locally relevant issues in its public safety element. In addition to those mentioned above, Carlsbad's Public Safety Element also addresses disaster preparedness and the protection from other local health and safety hazards, such as fire, hazardous materials and airport hazards.

Relationship to Community Vision

The Public Safety Element is most closely tied to the following objective in the Community Vision:

Core Value 8: Support quality, comprehensive education and life-long learning opportunities, provide housing and community services for a changing population, and maintain a high standard for citywide public safety.

Relationship to Other General Plan Elements

The Public Safety Element is strongly correlated to the Land Use and Community Design Element and the Open Space, Conservation and Recreation Element. The Land Use and Community Design Element includes consideration of fire, seismic, flooding and other hazards in land use designations and their intensity. Through restrictions on the development of hazardous areas, identified by

careful investigation as proposed in the Public Safety Element, the Land Use and Community Design Element supplements the policies of this element.

Related to the Open Space, Conservation and Recreation Element, areas subject to severe hazards, especially those related to seismic or flood-prone conditions, are designated for a reduced level of development or open space, or development is required to be set back from areas impacted by these factors.

Additionally, the Public Safety Element is related to the Mobility Element in that good street design and accessibility of the transportation system is vitally important in providing emergency services.

Finally, the Public Safety Element is related to the Housing Element and the Arts, History, Culture, and Education Element in that it identifies areas that may present hazardous conditions for residential structures and proposes precautionary measures related to older existing structures that may have historic or cultural significance.

6.2 Regulatory Setting

Public safety is a topic that is subject to extensive federal, state, and local regulations that span a variety of safety topics. Some of the key regulations and regulatory agencies are summarized below. The city is not responsible for administering all of the regulations; rather, the following discussion provides examples of how public safety in Carlsbad is a shared responsibility among various government agencies. For a fuller discussion of the regulatory setting pertaining to safety, the Environmental Impact Report for the General Plan should be consulted.

Federal Programs and Regulations

Environmental Protection Agency

The United States Environmental Protection Agency (U.S. EPA) enforces the Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 (RCRA), which regulates the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA was amended in 1984 by the Hazardous and Solid Waste Act (HSWA), which affirmed and extended the "cradle to grave" system of regulating hazardous wastes (controlling hazardous waste from the time it is generated until its ultimate disposal). The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the HSWA.

The 1980 Comprehensive Environmental Response, Compensation, and Liability Act, commonly known as Superfund, provides broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.

United States Department of Transportation

Transportation of chemicals and hazardous materials are governed by the United States Department of Transportation (DOT), which stipulates the types of containers, labeling, and other restrictions to be used in the movement of such material on interstate highways.

Federal Emergency Management Agency

The primary mission of the Federal Emergency Management Agency (FEMA) is to reduce the loss of life and property and to protect the nation from all hazards, including natural disasters, acts of terrorism, and other manmade disasters, by leading and supporting a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation. FEMA maps floodplains, and is currently (2013) in the process of preparing new floodplain mapping along much of the California coastline, including Carlsbad.

Disaster Mitigation Act

The Disaster Mitigation Act of 2000 requires a state mitigation plan as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the state level.

State Regulations

California Environmental Protection Agency

The management of hazardous materials and waste within California is under the jurisdiction of the California Environmental Protection Agency (Cal EPA). Cal EPA is responsible for developing, implementing and enforcing the state's environmental protection laws that ensure clean air, clean water, clean soil, safe pesticides and waste recycling and reduction. Within Cal EPA are various departments, three of which are described as follows:

Office of Environmental Health Hazard Assessment

The California Office of Environmental Health Hazard Assessment oversees implementation of the Safe Drinking Water and Toxic Enforcement Act of 1986 (commonly known as Proposition 65), which aims to protect California citizens and the state's drinking water sources from chemicals known to cause cancer, birth defects, or other reproductive harm and to inform citizens about exposures to such chemicals.

The California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) implements California Code of Regulations Title 22, Division 4.5, which provides standards for the management of hazardous waste. The DTSC has the authority to delegate enforcement of the state's hazardous waste regulations to local jurisdictions.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB), as well as nine regional water quality control boards, implements various laws related to the protection of water quality. The state and regional boards regulate wastewater discharges to surface and ground water; storm water discharges from construction, industrial, and municipal activities; discharges from irrigated agriculture; dredge and fill activities; alteration of federal water bodies; and other activities that could degrade water quality.

The California Department of Transportation

The California Department of Transportation (Caltrans) manages more than 50,000 miles of California's highway and freeway lanes, provides inter-city rail services, permits more than 400 public-use airports and special-use hospital heliports and works with local agencies. Caltrans is also the first responder for hazardous material spills and releases that occur on those highway and freeway lanes and inter-city rail services.

California Emergency Management Agency

The California Emergency Management Agency (Cal EMA) is responsible for assuring the state's readiness to respond to and recover from all hazards - natural, manmade, war-caused emergencies and disasters. Cal EMA assists local governments in developing their own emergency preparedness and response plans, in accordance with the Standardized Emergency Management System and the State Emergency Plan, for earthquakes, floods, fires, hazardous material incidents, nuclear power plant emergencies, dam breaks, and acts of terrorism. Cal EMA also administers the State of California Multi-Hazard Mitigation Plan (SHMP), which presents goals, strategies, and actions for reducing future disaster losses throughout the state. The SHMP is a federal requirement under the Disaster Mitigation Act of 2000 in order for the state to receive federal funds for disaster assistance.

Safe School Plan (California Education Code Sections 32280 et seq.)

This statute requires public schools to prepare a school safety plan that identifies strategies and programs that will ensure a high level of school safety related to: child abuse reporting; disaster procedures; on-campus violence; discrimination and harassment; safe ingress and egress to and from school; safe and orderly environment conducive to learning; and school discipline.

Local Regulations

County of San Diego Department of Environmental Health

The County of San Diego Department of Environmental Health (DEH) protects public health and environmental quality and implements and enforces local, state, and federal environmental laws. The DEH regulates the following: retail food safety; public housing; public swimming pools; small drinking water systems; mobile-home parks; onsite wastewater systems; recreational water; aboveground and underground storage tanks and cleanup oversight; and medical and hazardous materials and waste. In addition, DEH serves as the Solid Waste Local Enforcement Agency and prevents disease carried by rats and mosquitoes.

California Environmental Protection Agency's Unified Program

Cal EPA oversees a unified hazardous waste and hazardous materials management and regulatory program, commonly referred to as the Unified Program. The purpose of this program is to consolidate and coordinate six different hazardous materials and hazardous waste programs, and to ensure that they are consistently implemented throughout the state. State law requires local agencies to implement the Unified Program. The County of San Diego DEH, Hazardous

Materials Division is the local agency in charge of implementing the program in the county.

San Diego County Multi-Jurisdictional Hazard Mitigation Plan

Long-term prevention, mitigation efforts and risk-based preparedness related to specific hazards within the city are addressed in the 2010 San Diego County Multi-Jurisdictional Hazard Mitigation Plan (HAZMIT Plan). The HAZMIT Plan identifies specific risks for San Diego County and provides methods to help minimize damage caused by natural and manmade disasters. The final list of hazards profiled for San Diego County was determined as wildfire/structure fire, flood, coastal storms/erosion/tsunami, earthquake/liquefaction, rain-induced landslide, dam failure, hazardous materials incidents, nuclear materials release, and terrorism. Currently, the city is in the process of updating its mitigation strategies and action programs within the HAZMIT Plan. The County of San Diego Office of Emergency Services is responsible for coordinating with local jurisdictions and participating agencies to monitor, evaluate, and update the San Diego County Multi-Jurisdictional Hazard Mitigation Plan as necessary.

McClellan-Palomar Airport Land Use Compatibility Plan

The McClellan-Palomar Airport Land Use Compatibility Plan (ALUCP) is prepared by the San Diego County Regional Airport Authority to protect the safety of the public from airport related hazards. The ALUCP promotes compatibility between McClellan Palomar Airport and the land uses that surround it by addressing noise, overflight, safety, and airspace protection concerns. The ALUCP prevents exposure to excessive noise and safety hazards within the airports influence area (AIA), provides for the orderly growth of the airport and the area surrounding the airport, and safeguards the general welfare of the inhabitants within the vicinity of the airport and the public in general.

Carlsbad Municipal Code

Chapter 6.03 of the Carlsbad Municipal Code incorporates by reference Chapters 9 and 11 of Division 8 of Title 6 of the San Diego County Code of Regulatory Ordinances, which designates the County of San Diego DEH as the local agency responsible for implementing the state's Unified Program and specifies reporting, disclosure and monitoring requirements for hazardous materials and hazardous waste establishments.

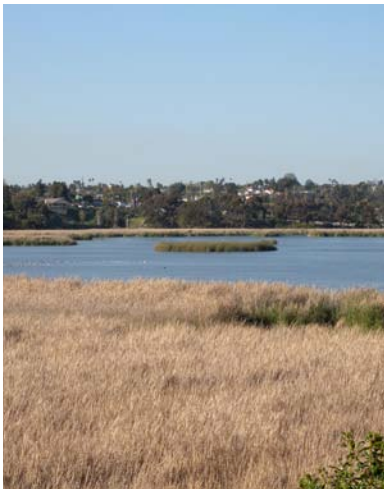
6.3 Flooding and Coastal Hazards

Surface Hydrology

The San Diego Region is divided into 11 hydrologic units that flow from elevated regions in the east toward coastal lagoons, estuaries, or bays in the west. Carlsbad is located within the Carlsbad Hydrologic Unit (HU), also referred to as the Carlsbad Watershed Management Area, which is approximately 210 square miles in area, extending from the headwaters above Lake Wohlford in the east to the Pacific Ocean in the west, and from Vista and Oceanside in the north to Solana Beach, Encinitas, and the community of Rancho Santa Fe to the south. The cities of Carlsbad, San Marcos, and Encinitas are entirely within this HU. There are numerous important surface hydrologic features within the Carlsbad HU including four unique coastal lagoons, three major creeks, and two large water storage reservoirs. Approximately 48% of the Carlsbad HU is urbanized. The dominant land uses are residential (29%), commercial/industrial (6%), freeways and roads (12%), agriculture (12%), and vacant/undeveloped (32%).[1]

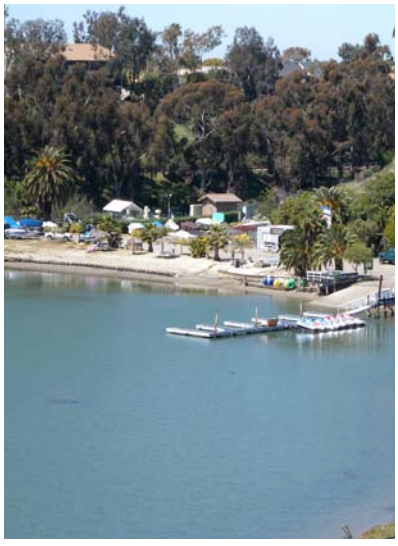
Buena Vista Lagoon

Buena Vista Lagoon is a 350-acre fresh water lagoon owned by the State of California and managed by the California Department of Fish and Wildlife (CDFW) as a nature reserve. Located on the border between Carlsbad and Oceanside, it became California's first ecological reserve in 1969. CDFW is the major property owner of the lagoon; however, a number of adjacent residential property owners have control of small portions of their property adjacent to the lagoon's wetland boundary. Although the lagoon itself is maintained as a nature reserve, much of the Buena Vista hydrologic area is already developed.



Agua Hedionda Lagoon

Agua Hedionda Lagoon is situated between Tamarack Avenue and Cannon Road and is comprised of three inter-connected lagoons, divided by the Interstate-5 freeway and a railroad bridge. Cabrillo Power LLC owns the three lagoon sections; the 66-acre outer lagoon adjacent to the Pacific Ocean, which primarily provides cooling water for the electric producing generators at the Encina Power Plant; the 27-acre middle lagoon is home to the North Coast YMCA Aquatic Park; and the 295-acre inner lagoon extends approximately 1,800 yards in a southeasterly direction from the Interstate-5 freeway bridge. The inner lagoon may be used for boating – permitted crafts include jet skis and powerboats (western portion) and passive vessels like sailboats and kayaks (eastern portion). At the eastern end of the lagoon is the Agua Hedionda Ecological Reserve, which was acquired in 2000 by the CDFW and consists of 186 acres of wetlands.



1 Project Clean Water Website 2012, www.projectcleanwater.org/html/ws_carlsbad.html, accessed September 21, 2012

Batiquitos Lagoon

The Batiquitos Lagoon consists of approximately 561 acres owned by both the CDFW and the California State Lands Commission and is protected as a game sanctuary and bird estuary. The lagoon was originally open to the ocean, but over time the construction of transportation corridors and other development resulted in sediment closing off the lagoon. Then, in the mid-1990s, a significant lagoon restoration and enhancement project, conducted by the City of Carlsbad, Port of Los Angeles and other cooperating agencies, allowed for the lagoon to open to the ocean again, as it exists today.

Stormwater Drainage

Much of the land area in Carlsbad is developed, resulting in impervious surfaces from the placement of roads, parking lots, buildings and other infrastructure. These facilities reduce the amount of water infiltration into the ground, increase direct runoff into the city's creeks and lagoons, and cause soil erosion and sedimentation, which can result in water quality degradation and flooding concerns.

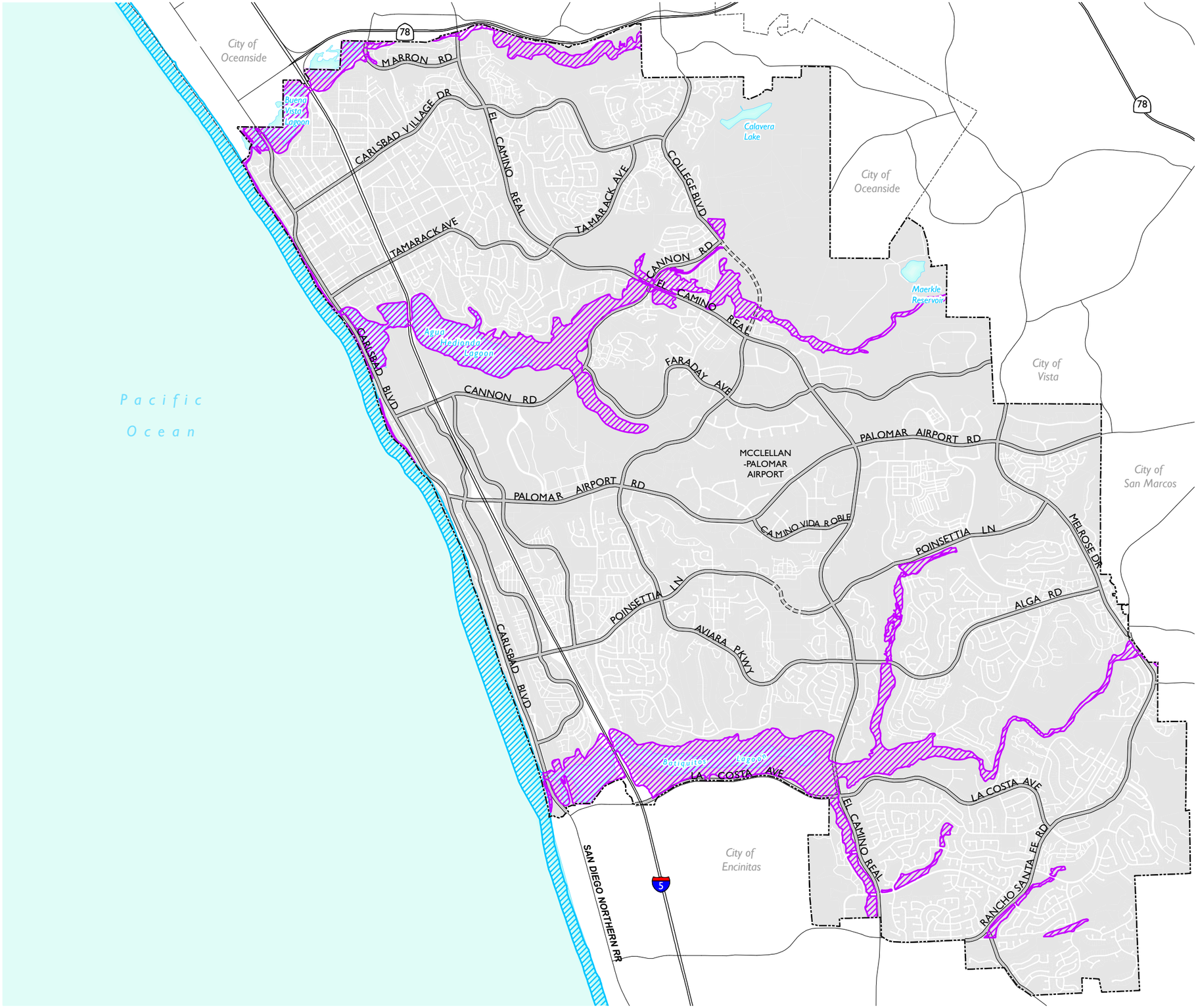
The City of Carlsbad currently employs a number of measures, including best management practices (BMPs), to prevent pollutants and hazardous materials from entering municipal stormwater conveyance systems. As storm drains are not connected to sanitary sewer infrastructure, water conveyed to these drains is not treated prior to discharging into creeks, lagoons and the ocean. Therefore, pollutants must be reduced and/or removed before entering urban conveyance systems. The city's Storm Water Protection Program covers all phases of development through planning, construction and existing development and educates and monitors developers, businesses, municipal facilities, residents, school children, and the general public to help prevent pollutants and other hazardous materials from entering storm drains.

Flood Zones

Floodplains are areas of land located adjacent to rivers or streams that are subject to recurring inundation, or flooding. Preserving or restoring natural floodplains helps with flood loss reduction benefits and improves water quality and habitat. Floods are typically described in terms of their statistical frequency. For example, a 100-year floodplain describes an area within which there is a one percent probability of a flood occurring in any given year. FEMA prepares Flood Insurance Rate Maps (FIRMs) that identify 100-year and 500-year flood zones. As shown in Figure 6-1, the potential flood hazard areas identified on the FIRM maps in Carlsbad include the entire coastline and the following major drainage basins:

- Buena Vista Creek and Buena Vista Lagoon
- Agua Hedionda Creek, its northern tributary, and the Agua Hedionda Lagoon

Figure 6-1: Potential Flood Hazards



Source: City of Carlsbad, 2013; FEMA, 2012; SANDAG, 2012; Dyett & Bhatia, 2013.

- San Marcos Creek and its northern tributary
- Batiquitos Lagoon
- Encinitas Creek

Most jurisdictions within San Diego County, including the City of Carlsbad, participate in the National Flood Insurance Program. Pursuant to the City of Carlsbad's Local Coastal Plan and Carlsbad Municipal Code Title 21 (Zoning), development is restricted within 100-year floodplain areas.

Dam Inundation

Dam inundation can be caused by the release of impounded water from structural failure or overtopping of a dam. The San Diego County HAZMIT Plan identifies dam-failure risk levels based on dam inundation map data. There are four dams and a reservoir located within or adjacent to the City of Carlsbad, as shown in Figure 6-2: the Calavera, Maerkle, San Marcos, and Bressi dams, and the Stanley A Mahr reservoir. The Calavera and Maerkle dams and Stanley A Mahr reservoir have been assigned high hazard ratings, San Marcos dam has a significant hazard rating, and the Bressi dam has a low hazard rating. All four dams and the reservoir have emergency action plans in place. These facilities are periodically inspected by the State of California Division of Dam Safety.

Sea Level Rise

In California, sea levels have risen by as much as seven inches along the coast over the last century, resulting in eroded shorelines, deterioration of infrastructure, and depletion of natural resources. In 2009, California adopted a Climate Adaptation Strategy[2], which summarizes the most recent science in predicting potential climate change impacts and recommends response strategies. The California Energy Commission's 2009 White Paper entitled, The Impacts of Sea-Level Rise on the California Coast also describes strategies to address the impacts of sea level rise in California communities. The San Diego County HAZMIT Plan has identified sea level rise as one of Carlsbad's (and other coastal cities) three primary climate change vulnerabilities (the other two being drought and fire). According to Cal-Adapt online tool (developed by the California Natural Resources Agency along with others), the historical average baseline (1961-1990) temperature in the Carlsbad area of 63.0 degrees F could increase by 3.6 to 6.0 degrees by the end of century period (2070-2090), depending on various emissions scenarios. According to the Sea Level Rise Adaptation Strategy for San Diego Bay (south of Carlsbad) prepared in 2012 by a consortium of cities, sea level in the bay could rise by as much as 17 inches by 2050 and five feet by 2100.

2 2009 California Climate Adaptation Strategy, California Natural Resources Agency. http://resources.ca.gov/climate_adaptation/docs/Statewide_Adaptation_Strategy.pdf. As of preparation of this General Plan, a 2013 update of the Adaptation Strategy is underway.

Areas within Carlsbad that are particularly vulnerable to sea level rise are those areas immediately adjacent to the coast and the lagoons, which are similarly vulnerable to coastal storms. Potential strategies to reduce the impacts of sea-level rise on the city may include hard engineering (seawalls, breakwaters, levees) soft engineering (beach nourishment and/or replenishment, wetlands restoration) and restricting or reducing development near the coastal areas.

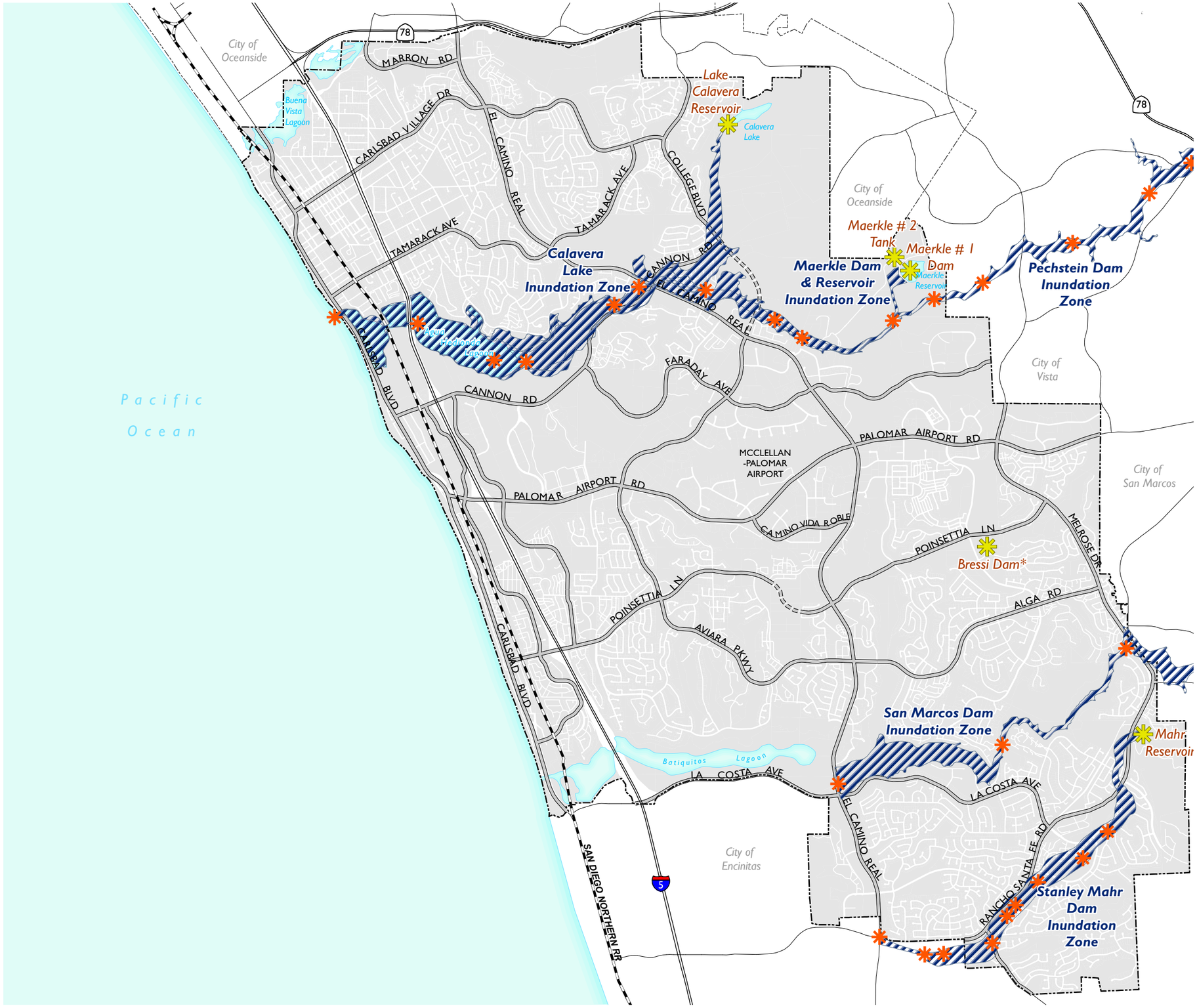
In 2011, FEMA initiated the California Coastal Analysis and Mapping Project/ Open Pacific Coast Study, which involves over 1,200 miles of new coastal flood hazard mapping and base-flood elevation determinations. Under this initiative, many coastal communities, including Carlsbad, will have coastal flood data and mapping updated for the first time in over 20 years. This study will improve the quality of the coastal data used for both floodplain management and planning purposes.

Tsunamis and Seiches

Tsunamis are long wavelength ocean waves generated by sudden movements of the ocean bottom during events such as earthquakes, volcanic eruptions, or landslides. The County of San Diego maps zones of high risk for tsunami run-up. As shown in Figure 6-3, the only areas identified within the City of Carlsbad as having risk for tsunami run-up are the immediate vicinity of the Buena Vista, Agua Hedionda, and Batiquitos lagoons.

Seiches are defined as wave-like oscillatory movements in enclosed or semi-enclosed bodies of water such as lakes or reservoirs. Potential effects from seiches include flooding damage and related hazards from spilling or sloshing water, as well as increased pressure on containment structures. The County of San Diego maps zones of high risk for dam inundation throughout the county. The high-risk areas are located in other communities upstream in the Carlsbad Watershed Management Area.

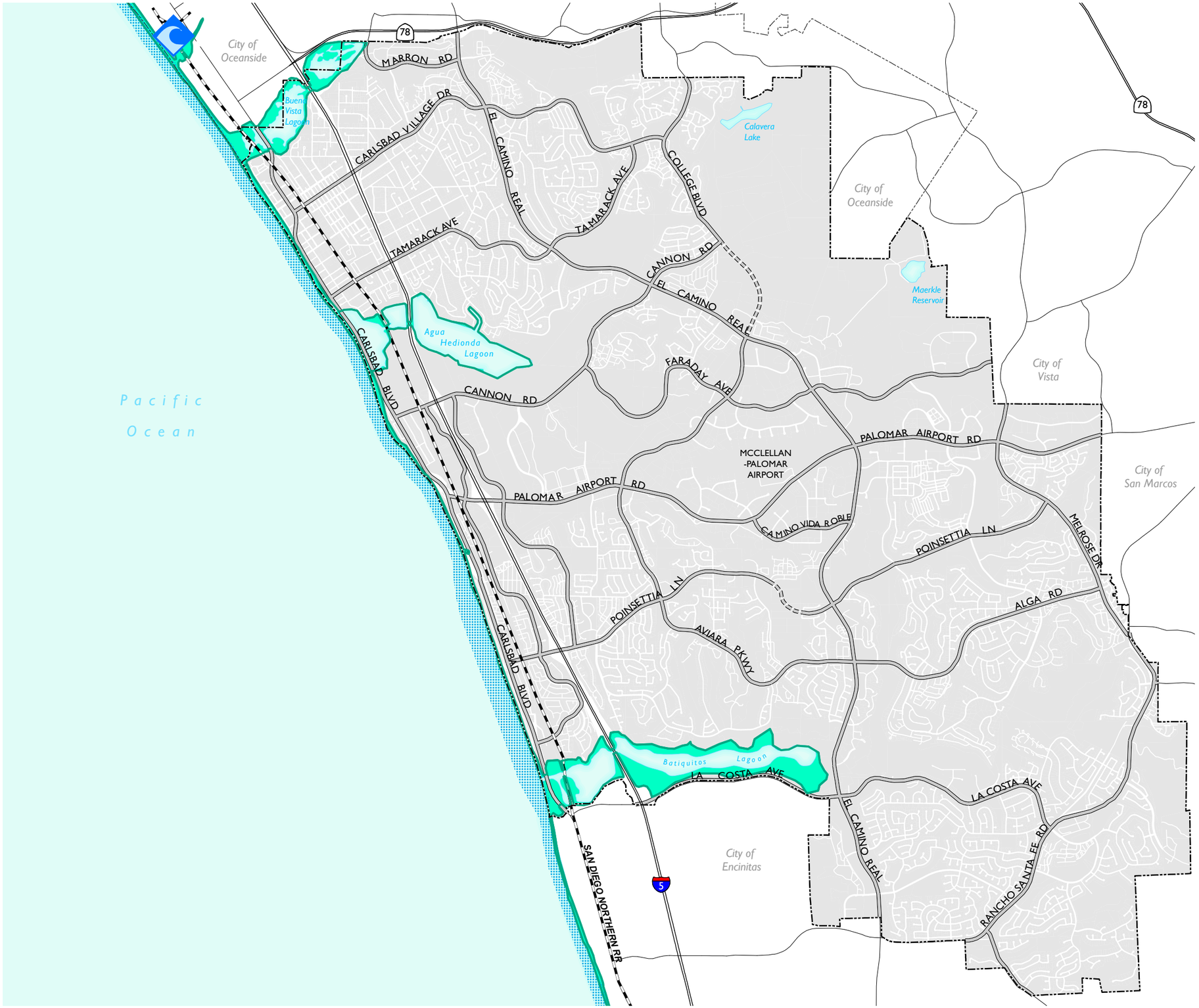
Figure 6-2: Dam Inundation Areas



(*There is no inundation zone associated with Bressi Dam)

Source: City of Carlsbad, 2013; SANDAG, 2013; DUDEK, 2013; Dyett & Bhatia, 2013.

Figure 6-3: Maximum Tsunami Projected Run-up



Source: City of Carlsbad, 2013; SANDAG, 2012; Dyett & Bhatia, 2013.

6.4 Geologic and Seismic Hazards

Geology and Soils

The City of Carlsbad is within the coastal portion of the Peninsular Ranges Geomorphic Province, a region characterized by northwest-trending structural blocks and intervening fault zones. Topographically, the Peninsular Ranges Province is composed of generally parallel ranges of steep-sloping hills and mountains separated by alluvial valleys. More recent uplift and erosion has produced the characteristic canyon and mesa topography present today in western San Diego County, as well as the deposition of surficial materials including Quaternary-age (less than approximately two million years old) alluvium, colluvium and topsoil.[3] Figure 6-4 shows the local geology of Carlsbad.

Seismicity

There are no active faults that run directly through Carlsbad. Additionally, the California Geologic Survey does not include the City of Carlsbad on its list of cities affected by Alquist-Priolo Earthquake Fault Zones. The nearest fault to the city is the Newport-Inglewood-Rose Canyon Fault, which runs offshore of the western edge of the city and is considered active. Other faults in the region include the Coronado Bank, La Nacion, Elsinore, Agua Caliente, and San Jacinto.

Fault activity has the potential to result in ground shaking, which can be of varying intensity depending on the intensity of earthquake activity, proximity to that activity, and local soils and geology conditions. Although there are no active faults within Carlsbad, the city is located within a seismically active region and earthquakes have the potential to cause ground shaking of significant magnitude. Figure 6-5 shows the location and extent of the profiled earthquake faults within San Diego County based on a United States Geological Survey earthquake model that shows probabilistic peak ground acceleration. Although located near fault lines, Carlsbad lies within a medium-low probabilistic peak ground acceleration zone.

Historical documents record that an earthquake centered either on the Rose Canyon or Coronado Bank faults struck San Diego on May 27, 1862, damaging buildings in Old Town and causing ground rupture near the San Diego River mouth. This earthquake is believed to have had a magnitude of about 6.0 based on descriptions of the damage it caused. The strongest recorded earthquake in the San Diego area was a magnitude of 5.3 on the Richter scale that struck on July 13, 1986 on the Coronado Bank fault, 25 miles offshore of Solana Beach. There have been several moderate earthquakes recorded within the Rose Canyon Fault Zone as well. On June 17, 1985, three earthquakes hit San Diego measuring

3 Ibid.

3.9, 4.0, and 3.9, respectively, and on October 28, 1986, a stronger earthquake with a magnitude of 4.7 occurred.[4]

Seismic Risk to Development

Earthquake damage to structures can be caused by ground rupture, liquefaction, ground shaking, and possibly inundation from tsunami (as discussed above). The level of damage at a location resulting from an earthquake will depend upon the magnitude of the event, the epicenter distance, the response of geologic materials, and the design and construction quality of structures.

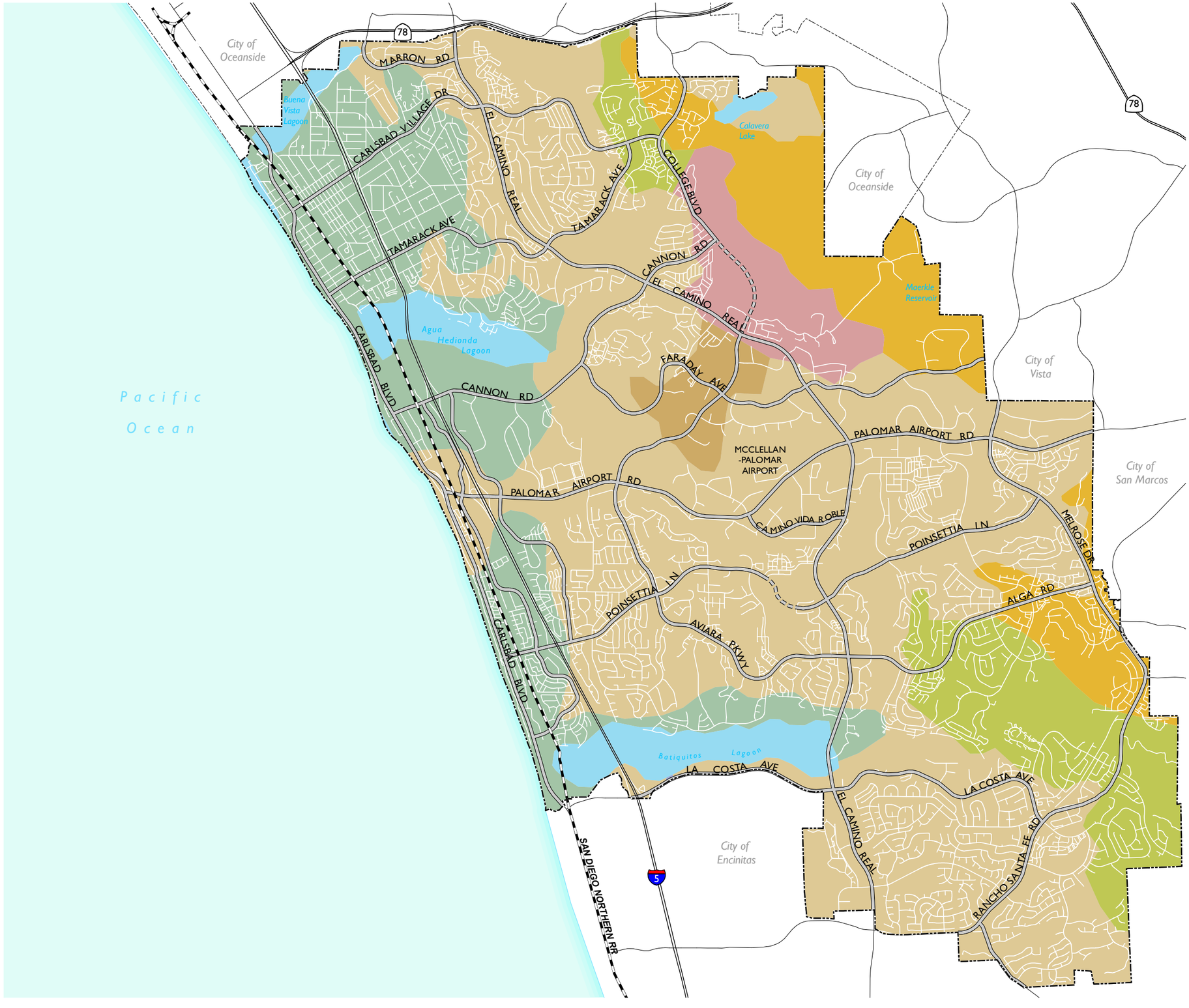
During an earthquake, shaking of granular loose soil saturated with water can lead to liquefaction, a condition in which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. As a result, this can cause structures to lose foundation-bearing capacity. Historically, seismic shaking levels in the San Diego region, including in Carlsbad, have not been sufficient enough to trigger liquefaction, and as such, the city generally has a low liquefaction risk. However, there are areas of the city that have a higher risk of liquefaction due to the presence of hydric soils or soils that are often saturated or characteristic of wetlands. These areas are limited to the immediate vicinity of the Buena Vista, Agua Hedionda, and Batiquitos Lagoons, as shown in Figure 6-6. Additionally, in general, south facing slopes in Carlsbad are gentle grade and not prone to landslides, while north facing slopes are generally steeper and more susceptible to landslides.

Development in a liquefaction hazard zone requires adherence to the guidelines for evaluating and mitigating seismic hazards as required by California Public Resources Code Section 2695(a). Before a development permit can be granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into the project design. Mitigation of liquefaction hazards can include edge containment structures (e.g. berms, dikes, retaining walls, etc.), driving piles, removal or treatment of liquefiable soils, or modification of site geometry.

The city's Building Division implements and enforces the Carlsbad Municipal Code and the California Building Code regulations relative to seismic risk to development. Chapter 18.07 of the Carlsbad Municipal Code specifies the need and establishes guidelines for the seismic upgrade of unreinforced masonry buildings.

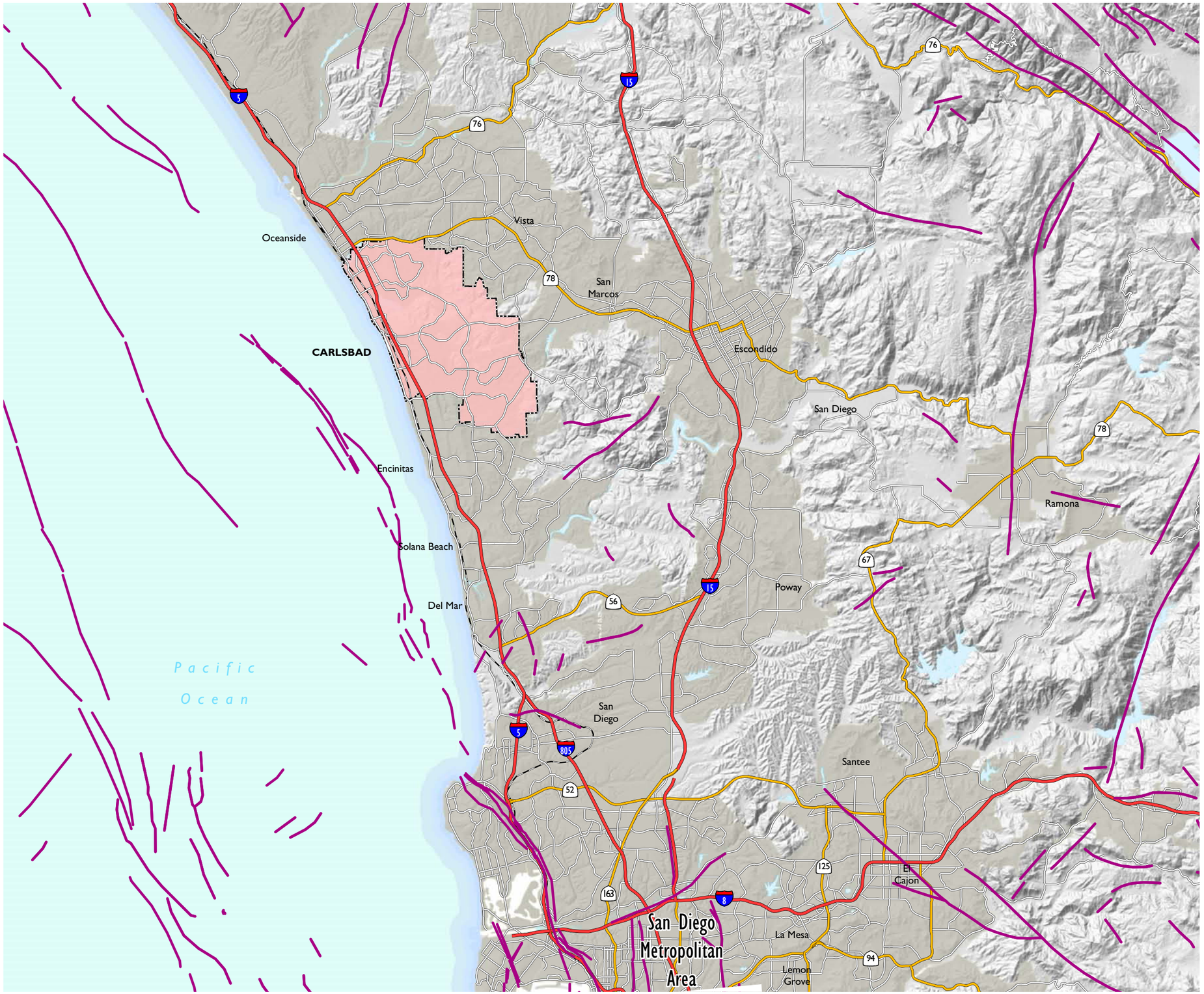
4 Deméré, Thomas A., Ph.D., San Diego Natural History Museum, Geology of San Diego County, California, http://www.sdnhm.org/archive/research/paleontology/sdfaults.html, accessed on September 25, 2012b

Figure 6-4: Geology



Source: City of Carlsbad, 2013; DUDEK, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

Figure 6-5: Earthquake Faults



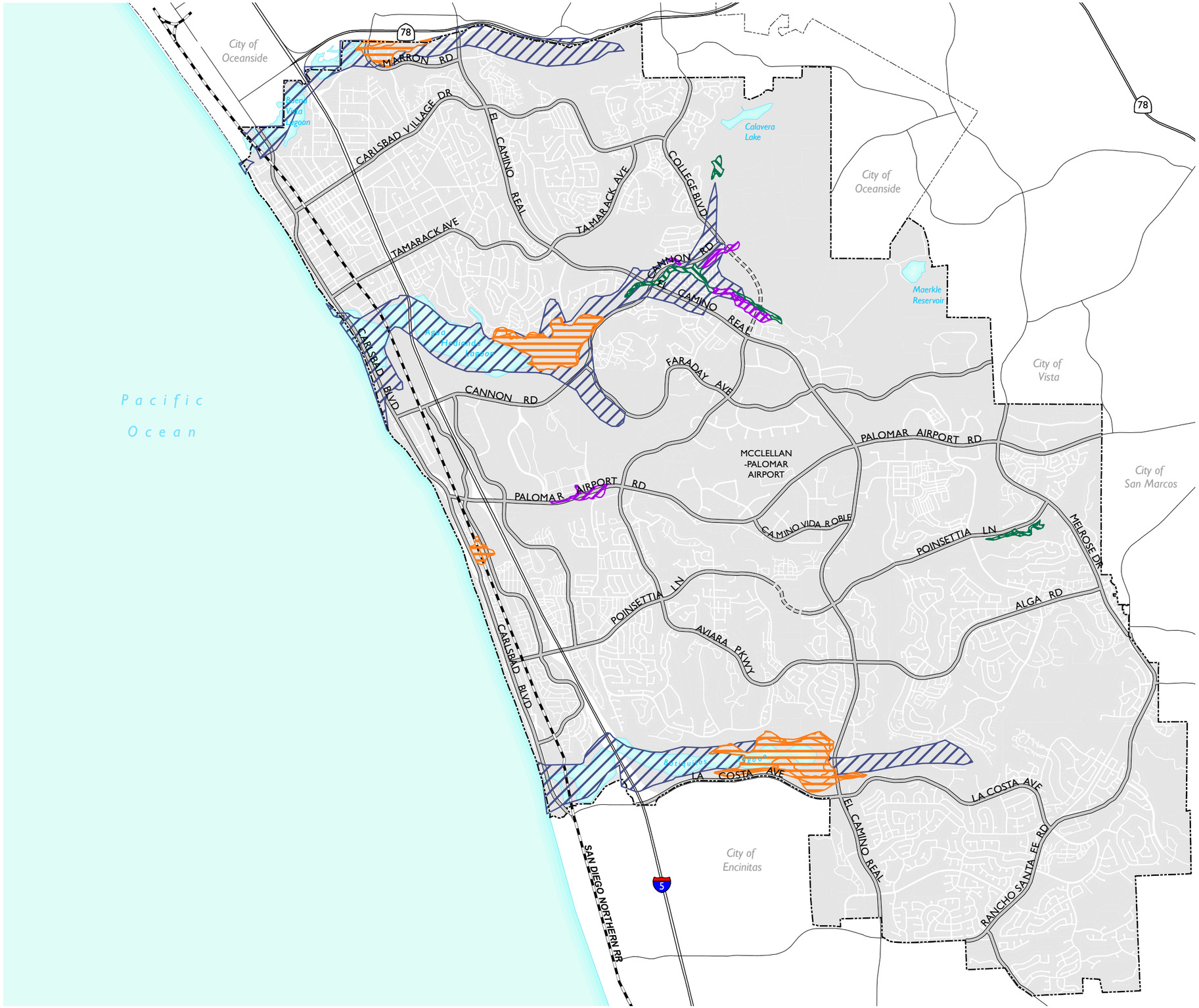
- Earthquake Fault Lines
- Freeway
- Major Highway
- Minor Highway/Major Street
- Passenger Rail Lines
- County Lines
- City of Carlsbad
- Urban Areas

0 3 6 12

Miles

Source: ESRI, 2009; City of Carlsbad, 2013; DUDEK, 2013; USGS, 2002; Dyett & Bhatia, 2013.

Figure 6-6: Liquefaction Hazards



Potential Liquefaction

- Riverwash
- Tidal flats
- Tujunga sand, 0 to 5 percent slopes
- Other Hazard

- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; DUDEK, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

6.5 Airport Hazards

For land use policies related to the airport, see Chapter 2: Land Use and Community Design. For noise policies related to the airport, see Chapter 5: Noise Element.

The McClellan-Palomar Airport, located in Carlsbad, serves the northern part of San Diego County. The airport, owned and operated by the County of San Diego, is defined by the Federal Aviation Administration (FAA)as a commercial service airport that, in addition to private aircraft, has regularly scheduled commercial flights to Los Angeles International Airport (LAX). The McClellan-Palomar Airport Land Use Compatibility Plan (ALUCP) is prepared according to Federal Aviation Administration requirements and adopted by the San Diego County Regional Airport Authority acting as the Airport Land Use Commission for the County of San Diego. The ALUCP provides measures to minimize the public's exposure to excessive noise and safety hazards within areas around the airport, and identifies areas likely to be impacted by noise and flight activity created by aircraft operations at the airport. These impacted areas include the Airport Influence Area (AIA), the Clear Zone, and the Flight Activity Zone. The AIA, shown in Figure 6-7, includes a large portion of the City of Carlsbad, as well as portions of the cities of Vista, San Marcos, and Escondido.

Within the AIA, the ALUCP establishes six safety zones for the purpose of evaluating safety compatibility of new/future land use actions. The safety zone boundaries depict relative risk of aircraft accidents occurring near the airport and are derived from general aviation aircraft accident location data and data regarding the airport's runway configuration and airport operational procedures. The ALUCP limits development intensities in these zones by imposing floor area and lot coverage maximums, by incorporating risk reduction measures in the design and construction of buildings, and/or by restricting certain uses altogether. Generally, allowable uses and development intensities range from most restrictive in Safety Zone 1 to least restrictive in Safety Zone 6 (these are shown in Figure 5-4). For example, all residential and virtually all non-residential uses are considered incompatible land uses in Zone 1, while all land uses in Zone 6 are considered to be either compatible or conditionally-compatible with the airport.

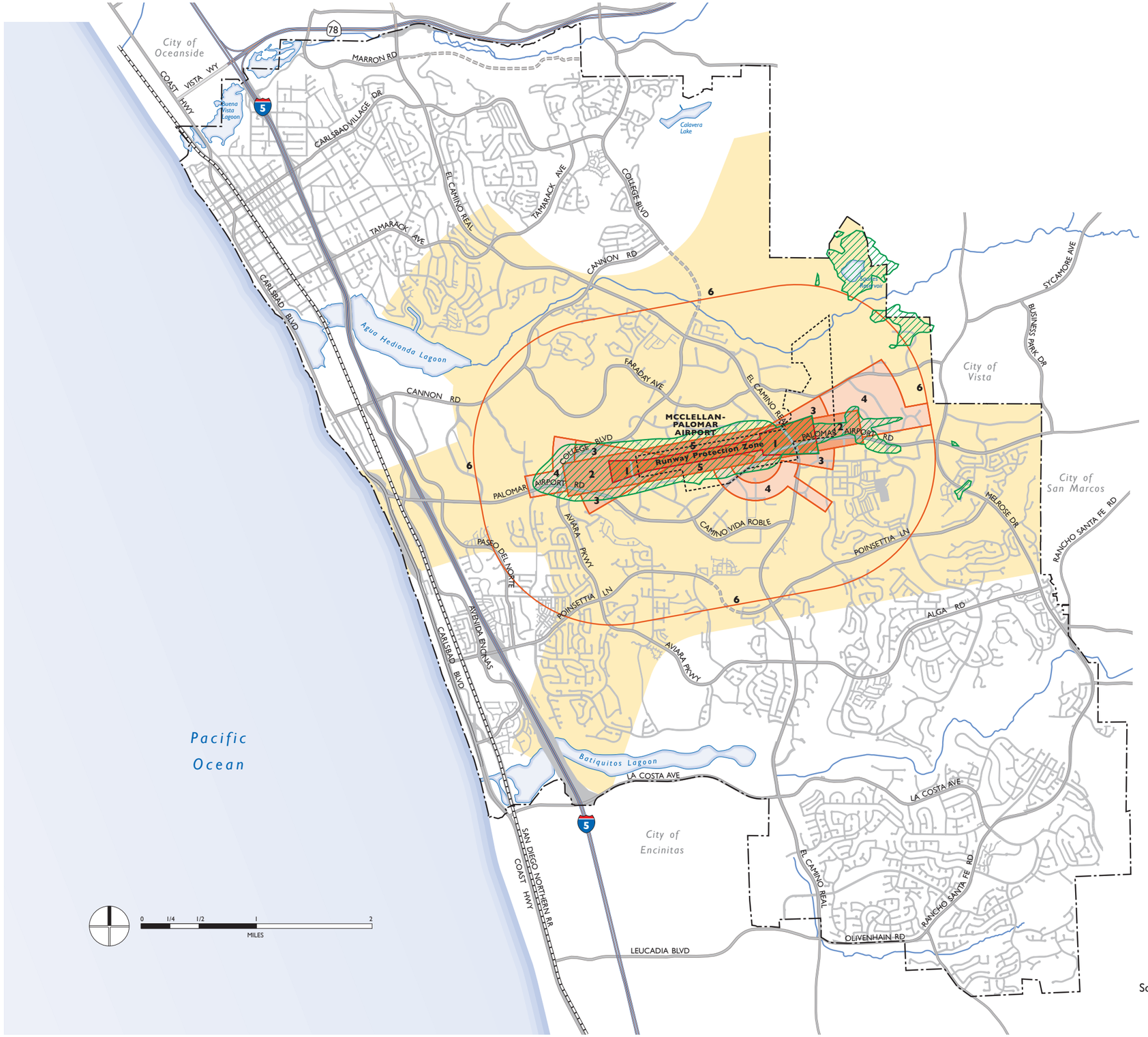
The FAA establishes airspace protection zones in the airspace above and surrounding airports in order to protect aircraft from obstructions such as buildings, towers, etc. in navigable airspace. Airspace protection zones are defined in Part 77 of the Code of Federal Aviation Regulations; the protected airspace around McClellan-Palomar Airport is depicted in Figure 6-7.

The ALUCP also requires that certain development projects record overflight notification documents in order to provide constructive notice to current and prospective property owners of aircraft activity within the vicinity of the

airport. Under certain circumstances, developers of specific properties may be required to grant avigation easements to the airport owner (County of San Diego). Among other things, an avigation easement grants the right of flight in the airspace above the property, allows the generation of noise and other impacts associated with overflight, restricts the height of structures, trees and other objects on the property, prohibits potential on ground flight hazards (sources of light/glare, etc.) and permits access to the property to remove or mark objects exceeding the established height limit. Figure 6-7 depicts the avigation easement and overflight notification areas surrounding the airport.

The city requires review of all proposed development projects within the AIA. New development proposals must process a site development plan, or other development permit, and be found to be consistent or conditionally consistent with applicable land use compatibility policies with respect to noise, safety, airspace protection, and overflight, as contained in the ALUCP. Additionally, development proposals are required to comply with FAA regulations concerning the construction or alteration of structures that may affect navigable airspace.

Figure 6-7: McClellan-Palomar Airport Influence Area/Safety Zones



- Airport Safety Zones
  - Zone 1- Runway Protection Zone
  - Zone 2 - Inner Approach/Departure Zone
  - Zone 3 - Inner Turning Zone
  - Zone 4 - Outer Approach/Departure Zone
  - Zone 5 - Sideline Zone
  - Zone 6 - Traffic Pattern Zone
- Avigation Easement Areas*
- Airport Overflight Notification Area (only applies to new resdiential development)
- Airport Property Boundary
- City Limits
- Major Road
- Planned Road
- Railroad

*Defined as the Runway Protection Zone or within the contour of the 65 dB CNEL or areas where the ground penetrates a Part 77 airspace surface.

Source: McClellan-Palomar Airport Land Use Compatibility Plan, 2010.

6.6 Hazardous Materials

Hazardous materials include a wide variety of substances commonly used in households and businesses. Motor oil, paint, solvents, lawn care and gardening products, household cleaners, gasoline, and refrigerants are among the diverse range of substances classified as hazardous materials. Nearly all businesses and residences generate some amount of hazardous waste. Certain businesses and industries, including gas stations, automotive service and repair shops, printers, dry cleaners, and photo processors, generate larger amounts of such substances. Hospitals, clinics, and laboratories generate medical waste, much of which is also potentially hazardous.

Some hazardous materials present a radiation risk. Radioactive materials, if handled improperly, or if radiation is accidentally released into the environment, can be dangerous because of the harmful effects of certain types of radiation on the human body.

Hazardous Materials Transport

Major transportation routes within Carlsbad include Interstate 5 and State Route 78, surface streets, and the San Diego Northern railroad. Petroleum pipelines, as well as the oil and natural gas pipelines to the Encina Power Plant, also traverse through Carlsbad, and there are high pressure fuel lines along El Camino Real and other areas, as shown in Figure 6-8. These transportation routes and pipelines are used to transport hazardous materials from suppliers to users. Transportation accidents involving hazardous materials could occur on any of the routes, potentially resulting in explosions, physical contact by emergency response personnel, environmental degradation, and exposure to the public.

Hazardous Materials Facilities

The County of San Diego, through its California Environmental Protection Agency (CalEPA) Unified Program, has recorded (as of 2012) approximately 338 facilities within Carlsbad that store and maintain chemical, biological, and radiological agents, and explosives. In addition, there are 180 facilities within the city that are registered with the U.S. EPA as generators of hazardous waste.[5]

Potential Environmental Hazards

Sites within the City of Carlsbad where the presence of hazardous materials present potential environmental hazards were identified using information from state databases and a review of online regulatory files for select sites. The databases used were EnviroStor, which identifies hazardous waste facility and cleanup sites, and SWRCB GeoTracker, which identifies permitted underground

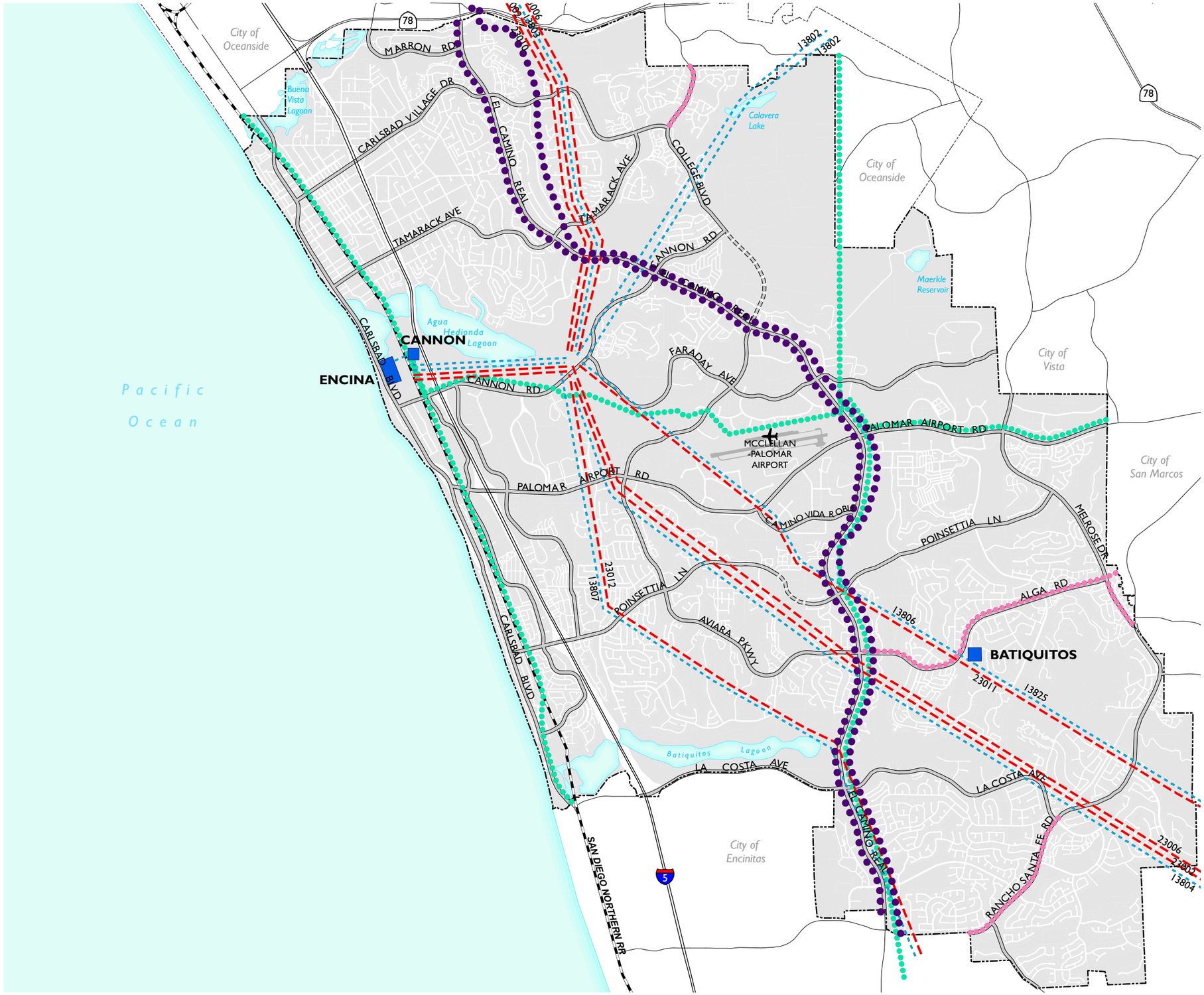
5 County of San Diego, 2010, San Diego County Multi-Jurisdiction Hazard Mitigation Plan, page 4-51.

storage tanks (UST) and cleanup sites. The databases included the following types of sites: release sites (cleanup sites), UST sites, permitted hazardous waste facilities, wastewater treatment tiered permit facilities, and proposed school sites evaluated by the California DTSC for the presence of hazardous materials.

The hazardous materials sites identified in the EnviroStor and GeoTracker databases were evaluated as part of the General Plan Environmental Impact Report (EIR) in order to rank the sites in terms of potential environmental concern.

Using the databases, a total of 214 hazardous materials sites with 126 unique listings were identified within Carlsbad (see the General Plan EIR for details of the listings). A total of 110 of those unique site listings have had known releases, while the remaining 16 have not had known releases. The San Diego Regional Water Quality Control Board's Geographic Environmental Information Management System is a data warehouse that tracks regulatory data about underground fuel tanks, fuel pipelines and public drinking water supplies using GeoTracker; as information in the database is periodically updated, the database should be consulted for current information.

Figure 6-8: Electric and Gas Trasmission Lines



Electric Substations

Electric Transmission Lines*

230 KV

138 KV

Gas Transmission Lines*

Above 200 psi

Above 60 psi

Petroleum Gas Mains

Highways

Major Street

Planned Street

Railroad

City Limits

* Note that the location of electric transmission lines and gas transmission pipelines are approximate. The map provides a generalized guide and is not an authoritative depiction of where the risks are more likely. A site-specific study should be performed for detail analysis.

500 ACRES

100 ACRES

0 0.5 1 2

Miles

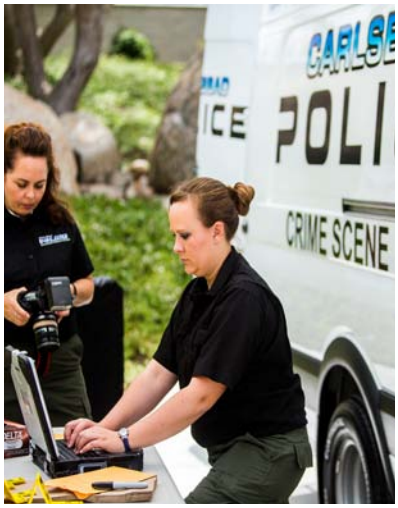
Source: City of Carlsbad, 1994; SANDAG, 2013; Dyett & Bhatia, 2013.

6.7 Police, Fire, and Emergency Services

Police Services

The Carlsbad Police Department conducts its safety services out of the Carlsbad Public Safety and Service Center located on Orion Way. The Public Safety Center location is depicted on Figure 6-9. The patrol division is the core of the Police Department's law enforcement services, responding to more than 90,000 calls for service annually. Although street patrols are the majority of the division's activity, other special services include canine units, bicycle patrol, crisis negotiations, bilingual services, tactical response team (SWAT; Special Weapons and Tactics) and mental health assistance teams.

In May 2012, the Carlsbad Safety Training Center was completed to provide necessary training for local police, fire and other safety workers. The training center is located next to the Public Safety and Service Center, and includes a shooting range and structures that can be used to simulate fires in residential and commercial buildings as well as help police conduct tactical training.



Anticipated Space Needs for the Police Department

To accommodate population growth, the Police Department expects to grow to a point where it will need to occupy the space inside the Public Safety and Service Center that is currently occupied by Fire Administration. Alternative solutions the Police Department is considering include relocating some or all Police Department services to another facility, relocating Fire Administration to another facility, or expanding the Public Safety and Service Center to accommodate Police Department growth and the continued presence of Fire Administration. Also needed by the Police Department is a secure storage facility for large pieces of evidence, such as vehicles.

Fire and Emergency Medical Services

The City of Carlsbad has six fire stations, indicated on Figure 6-9. The oldest of the stations was constructed in 1966, while the newest was completed in 2009.

Fire Operations is the largest division within the Carlsbad Fire Department and is responsible for fire suppression, rescue, emergency medical service delivery and disaster mitigation. The Fire Department delivers advanced life support level care on all fire engines and ambulances, including a licensed paramedic. Currently, more than 75 percent of the city's fire suppression personnel are licensed paramedics; frequently multiple paramedics are available on-scene at emergency incidents.

City of Carlsbad SWAT medics are firefighter/paramedics on special assignment working alongside the Carlsbad Police Department SWAT team. SWAT

TABLE 6–1: FIRE STATIONS SUMMARY

STATIONS	BUILT	ADDRESS	STAFFING DESCRIPTION
1	1966	1275 Carlsbad Village Dr.	Crew of five: captain, engineer and three firefighter/paramedics
2	1969	1906 Arenal Rd.	Crew of five: captain, engineer and three firefighter/paramedics
3[1]	1973	3701 Catalina Dr.	Crew of three: captain, engineer and firefighter/paramedic
4	1986	6885 Batiquitos Dr.	Crew of three: captain, engineer and firefighter/paramedic
5	1988	2540 Orion Way	Crew of four: duty battalion chief, captain, engineer, and firefighter/paramedic
6	2009	7201 Rancho Santa Fe Rd.	Crew of three: captain, engineer, and firefighter/paramedic

1 Fire Station 3 is planned to be replaced with a new station to be constructed in the Robertson Ranch Master Plan area. Construction of the new station is anticipated to be completed by the end of 2014.

Source: City of Carlsbad Fire Department Service Provider Information Request, September 2010.

medics are also deployed with Carlsbad police officers in support of other law enforcement units such as the San Diego Sheriff's SWAT team and the regional law enforcement task force.

Anticipated Space Needs for the Fire Department

Based on needs identified by the Carlsbad Police Department for additional space, considerations will need to be made for the relocation of Fire Administration in close proximity to Fire Station No. 5 and the Carlsbad Safety Training Center. At that time, consideration for the relocation of Fire Prevention staff to the same location should also be made.

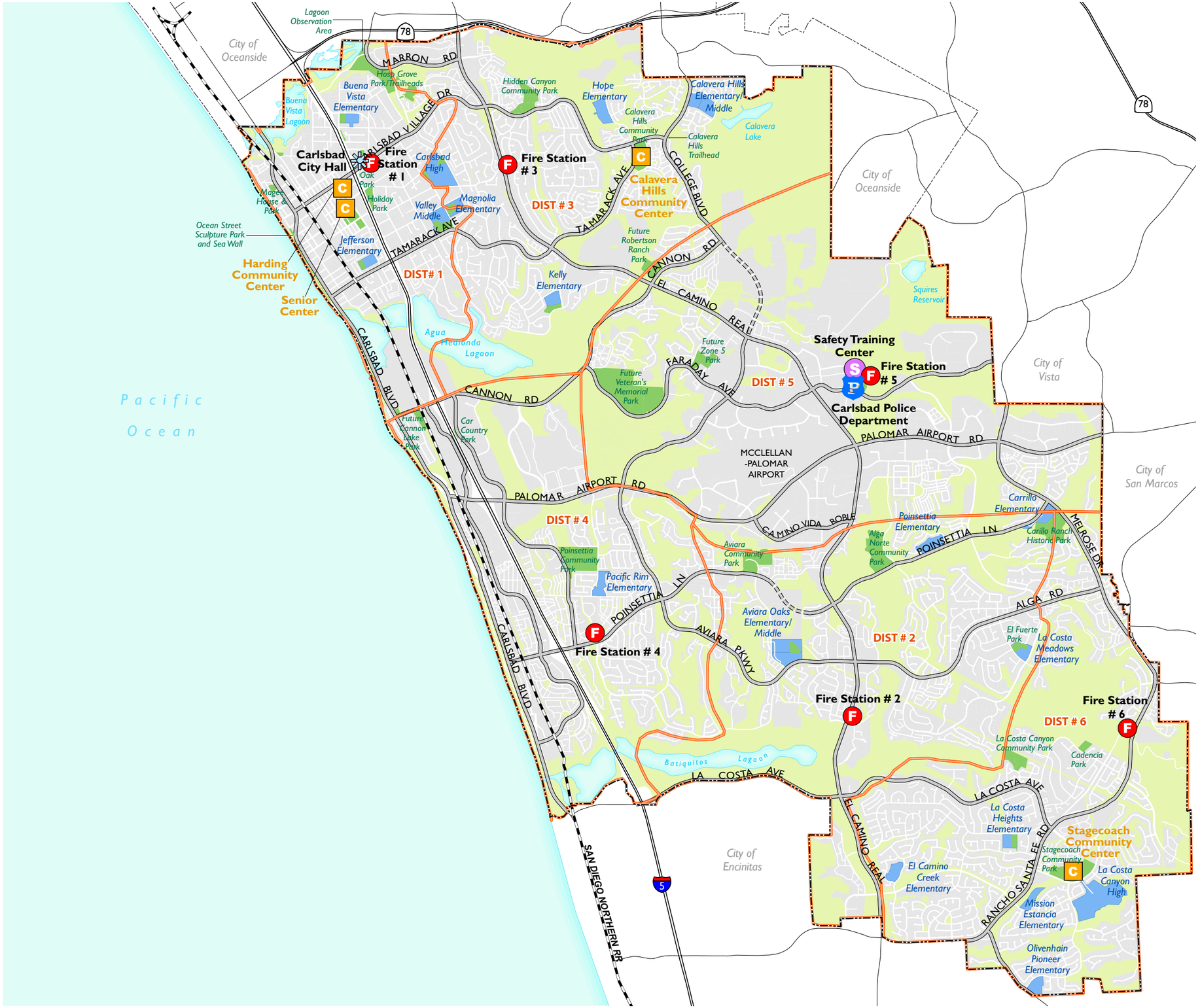
The future needs of the Fire Department must be considered when embarking on the remodeling or rebuilding of a fire station. Three out of the six fire stations (Fire Stations 1, 2 and 3) are currently minimally meeting the operational needs of the city. These three stations are 40 years or older and nearing the end of their service life; Stations 1 and 2 should be considered for major remodel or reconstruction; Fire Station 3 is planned to be replaced in 2014 with a new station in the Robertson Ranch Master Plan area. Increased service demands, changes in staffing, and the increasing size of fire apparatus require considerations for increasing the size and capabilities of these city facilities.

Wildland Fire Hazards

The California Department of Forestry and Fire Protection (CAL FIRE) has mapped fire threat potential throughout California. CAL FIRE ranks fire threat according to the availability of fuel and the likelihood of an area burning (based on topography, fire history, and climate).[6] The rankings include little or no fire threat, moderate, high, and very high fire threat. The large amounts of open space and wildland make Carlsbad susceptible to brush fires year round. The proximity of native vegetation and the climate of the region contribute to a moderate to high threat of wildfires in the city, as illustrated in Figure 6-10. Most

6 County of San Diego, 2010, San Diego County Multi-Jurisdiction Hazard Mitigation Plan, page 4-89.

Figure 6-9: Public Safety Services



- Police Station
- Fire Station
- Safety Training Center
- Community/Senior Centers
- City Hall
- Public Schools
- Existing and Planned Parks
- Open Space
- Fire Districts
- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

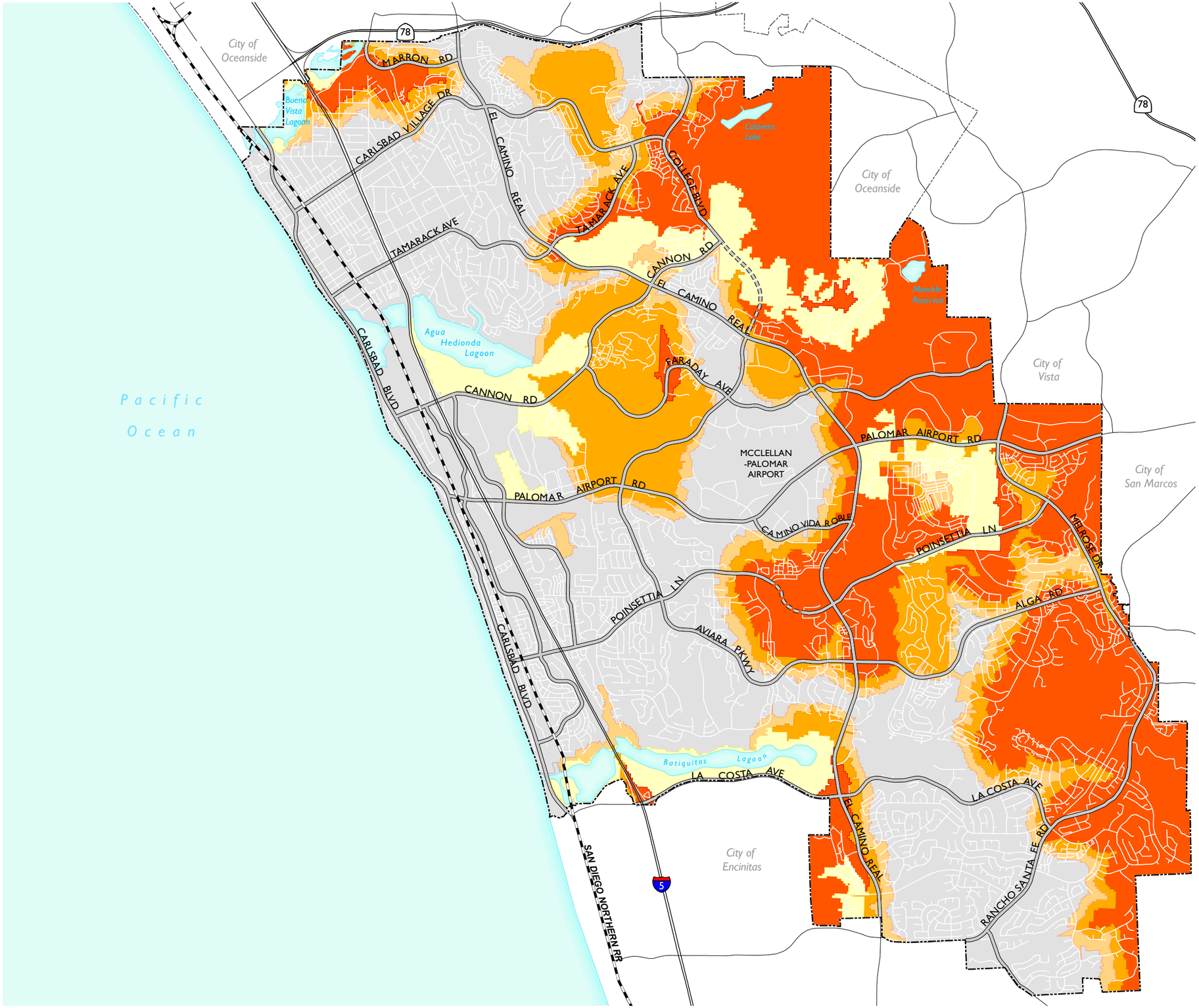
100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

Figure 6-10: Structure Fire/Wildfire Threat



Fire Hazard Severity Zones

- Very High Threat
- High Threat
- Moderate Threat
- Little or No Threat
- Urban

- Highways
- Major Street
- Planned Street
- Railroad
- City Limits

500 ACRES

100 ACRES

0 0.5 1 2

Miles

Source: City of Carlsbad, 2013; DUDEK, 2013; SANDAG, 2013; Dyett & Bhatia, 2013.

of Carlsbad has only moderate fire threat; however there is high and very high fire threat in the central and eastern portions of the city.[7]

Urban Fire Hazards

Urban fire risk in Carlsbad is greatest in older structures and neighborhoods built before modern building codes for fire safety and building systems were in place. Other factors affecting urban fire risk and relative likelihood of loss of life or property include building age, height and use; storage of flammable material; building construction materials; availability of sprinkler systems; and proximity to a fire station and hydrants.

Peakload Water Supply Requirement

The Carlsbad Fire Department requires a minimum flow of water for fire protection in accordance with the adopted amended California Fire Code and the Insurance Services Office standards. Water mains serving single-family detached houses must provide a flow of 1,500 gallons per minute, in addition to the peak normal maximum daily consumption needs for a neighborhood. The required fire-flow standard for commercial, industrial, manufacturing and large apartment buildings varies from 1,500 to 8,000 gallons per minute, in addition to the peak normal daily consumption needs. This standard is based on type of construction, type of use and any built-in fire protection (sprinklers, etc.).

There are currently no known water flow pressure or supply deficiencies in Carlsbad. The Carlsbad Fire Marshal reviews proposed projects to ensure adequate fire hydrant locations, water flow pressure, and access for emergency vehicles is provided.

Minimum Road Widths and Clearances Around Structures

Clear emergency vehicle access to buildings is important. Such access is regulated by the adopted and amended California Fire Code and adopted Carlsbad land development engineering standards. Under the current Fire Code, all portions of a building shall be within 150 feet of a serviceable fire access road.

7 County of San Diego, 2010, San Diego County Multi-Jurisdiction Hazard Mitigation Plan, page 4-93 and 4-94.

6.8 Emergency Preparedness

Coordination and Management

Chapter 6.04 of the Carlsbad Municipal Code defines the organization, power and duties of the City of Carlsbad emergency organization. The City of Carlsbad Fire Department's Emergency Preparedness Division supports the emergency organization by further defining the scope of the city's emergency management program and large-scale incident response activities. The strategic focus of the emergency management program is contained in the Emergency Preparedness Division's mission statement. Carlsbad's Emergency Management Administrative Team (CEMAT) assists the Emergency Preparedness Division in preparedness, response, recovery and mitigation tasks. By resolution, the city has adopted the State of California Standardized Emergency Management System (SEMS), National Incident Management System (NIMS) and Incident Command System (ICS) as its emergency management systems. All City of Carlsbad employees are disaster service workers. Carlsbad's Community Emergency Response Team (CERT) is made up of City of Carlsbad disaster volunteers and reports to the Emergency Preparedness Division, or the EOC in the event of an actual disaster. In general, the City of Carlsbad Emergency Operations Plan (EOP) further establishes and details emergency organization, assigns tasks, specifies policies and general procedures, and provides for coordination of planning efforts of the various emergency staff and service elements utilizing SEMS, NIMS and ICS. The city's EOP identifies the city's Emergency Operations Center (EOC) as the location from which centralized emergency management would be performed during a major emergency or disaster, including receiving and disseminating information, maintaining contact with other EOCs and providing instructions to the public. Emergency preparedness and disaster response information is shared with the public through the City of Carlsbad's website, reverse-911 systems, social media including "sdemergency"mobile application, traditional media, public outreach and the EOC hotline, when activated.

Evacuation Routes

Carlsbad is a participant in the Unified San Diego County Emergency Services Organization (USDCESO). The USDCESO Operational Area Emergency Plan (October 2010) contains evacuation routes resulting from a variety of emergencies. Evacuation routes in this document are incorporated by reference in this General Plan; the document can be accessed at http://www.co.san-diego.ca.us/oes/emergency_management/protected/docs/2010_Complete_Plan_w_Annexes.pdf

City of Carlsbad EOP Annex Q (2013) provides Carlsbad-specific evacuation information and is available in the EOC.

6.9 Goals and Policies

Goals

6-G.1 Minimize injury, loss of life, and damage to property resulting from fire, flood, hazardous material release, or seismic disasters.

6-G.2 Minimize safety hazards related to aircraft operations in areas around the McClellan-Palomar Airport.

6-G.3 Maintain safety services that are responsive to citizens' needs to ensure a safe and secure environment for people and property in the community.

Policies

Flooding and Coastal Hazards

6-P.1 Enforce the Cobey-Alquist Floodplain Management Act and the city's Floodplain Management Regulations to prohibit construction of structures in a designated floodway where such development would endanger life or significantly restrict the carrying capacity of the designated floodway; and to regulate development within other areas of special flood hazard, flood related erosion hazard and mudslide hazard to ensure such development does not adversely affect public health and safety due to water and erosion hazards, or result in damaging increases in erosion, flood height or velocities.

6-P.2 Continue to implement and pursue flood control programs that reduce flood hazards, such as the city's Grading Ordinance and the Floodplain Management Regulations.

6-P.3 Cooperate and coordinate with federal, state and local jurisdictions, and agencies involved in the mitigation of flood hazards from dam inundation, tsunamis, sea level rise, and major flood events.

6-P.4 Require all proposed drainage facilities to comply with the city's Standard Design Criteria to ensure they are properly sized to handle 100-year flood conditions.

6-P.5 Require installation of protective structures or other design measures to protect proposed building and development sites from the effects of flooding.

6-P.6 Enforce the requirements of Titles 18, 20, and 21 pertaining to drainage and flood control when reviewing applications for building permits and subdivisions.

6-P.7 Comply with all requirements of the California Department of Water Resources' Division of Safety of Dams to ensure adequate flood control.

6-P.8 Comply with Federal Emergency Management Agency (FEMA) requirements to identify flood hazard areas and control

development within these areas in order for residents to qualify for federal flood insurance. Cooperate with FEMA on shoreline flooding hazards and other mapping efforts.

Geology and Seismicity

6-P.9 Allow for consideration of seismic and geologic hazards at the earliest possible point in the development process, preferably before comprehensive engineering work has commenced.

6-P.10 Maintain geotechnical report guidelines identifying specific requirements for various levels of geotechnical evaluation, including reconnaissance studies, preliminary geotechnical investigation reports, and as-graded geotechnical reports.

6-P.11 Use information in Figure 6-4 as a generalized guideline for planning purposes and in determining the type and extent of geotechnical report to be required for a proposed development project. When a geotechnical report is required, require submission of the report and demonstration that a project conforms to all mitigation measures recommended in the report prior to city approval of the proposed development.

6-P.12 Require a geotechnical investigation and report of all sites proposed for development in areas where geologic conditions or soil types are susceptible to liquefaction. Also require demonstration that a project conforms to all mitigation measures recommended in the geotechnical report prior to city approval of the proposed development (as required by state law).

6-P.13 Prohibit location of critical structures directly across known earthquake faults unless a geotechnical and/or seismic investigation is performed to show that the earthquake fault is neither active nor potentially active.

6-P.14 Require applicants to conduct detailed geologic and seismic investigations at sites where the construction of critical structures (high-occupancy structures and those that must remain in operation during emergencies) and structures over four stories are under consideration.

6-P.15 In accordance with the California Subdivision Map Act, deny subdivision maps if a project site is not physically suitable for either the type or density of a proposed development because of geologic, seismic, or other hazards.

6-P.16 Require qualified geotechnical engineering professionals to review grading plans and inspect areas of excavation during and after grading, to evaluate slope stability and other geotechnical conditions that may affect site development and public safety. In areas of known or suspected landslides and/or adverse geologic conditions, the following determinations should be made: extent of landslide, depth-to-slide plane, soil types and strengths, presence of clay seams and ground water conditions.

6-P.17 Continue to regulate development, including remodeling or structural rehabilitation, to ensure adequate mitigation of safety hazards on sites having a history or threat of seismic dangers, erosion, subsidence, or flooding.

Airport Hazards

6-P.18 Ensure that development in the McClellan-Palomar Airport Influence Area is consistent with the land use compatibility policies contained in the McClellan-Palomar Airport Land Use Compatibility Plan.

See also policies in the Land Use and Community Design Element related to McClellan-Palomar Airport.

Soils and Hazardous Materials

6-P.19 Limit hazards associated with the manufacture, use, transfer, storage and disposal of hazardous materials and hazardous wastes through enforcement of applicable local, county, state and federal regulations.

6-P.20 Coordinate with the County of San Diego and use the San Diego County Multi-Jurisdictional Hazard Mitigation Plan as a guide for implementing actions to reduce hazardous waste impacts.

6-P.21 Regulate locations for the manufacture, storage, and use of hazardous materials within the city through implementation of Carlsbad Municipal Code Title 21 (Zoning Ordinance).

6-P.22 Regulate development on sites with known contamination of soil and groundwater to ensure that construction workers, future occupants, and the environment as a whole, are adequately protected from hazards associated with contamination, and encourage cleanup of such sites.

6-P.23 Provide for hazardous materials emergency incident responses. Coordinate such responses with applicable federal, state and county agencies.

6-P.24 Maintain regulations that require proper storage and disposal of hazardous materials to reduce the likelihood of leakage, explosions, or fire, and to properly contain potential spills from leaving the site.

6-P.25 Enhance and expand the use of desiltation/pollutant basins to function as hazardous material spill control facilities to prevent the spread of contaminants to downstream areas.

6-P.26 Support public awareness and participation in household hazardous waste management, solid waste, and recycling programs.

Police, Fire and Emergency Services

6-P.27 Maintain adequate Police and Fire Department staff to provide adequate and timely response to all emergencies.

6-P.28 Ensure Fire Department facilities and service are provided consistent with the minimum performance standards of the city's Growth Management Plan.

6-P.29 Encourage physical planning and community design practices that deter crime and promote safety.

6-P.30 Maintain close coordination between planned improvements to the circulation system within the city and the location of fire stations to assure adequate levels of service and response times to all areas of the community.

6-P.31 Consider site constraints in terms of hazards and current levels of emergency service delivery capabilities when making land use decisions. In areas where population or building densities may be inappropriate to the hazards present, take measures to mitigate the risk of life and property loss.

6-P.32 Coordinate the delivery of fire protection services through mutual aid agreements with other agencies when appropriate.

6-P.33 Enforce the Uniform Building and Fire codes, adopted by the city, to provide fire protection standards for all existing and proposed structures.

6-P.34 Promote community awareness of possible natural and man-made hazards, response plans and measures that can be taken to protect lives.

6-P.35 When future development is proposed to be intermixed with wildlands and/or adjacent to wildlands, require applicants to comply with the city's adopted Landscape Manual, which includes requirements related to fire protection, and calls for preparation of a fire protection plan when a proposed project contains or is bounded by hazardous vegetation or is within an area bounded by a very high fire hazard severity zone, or as determined by the Fire Code official or his representative.

Emergency Preparedness

6-P.36 Maintain and periodically update the City of Carlsbad Emergency Operations Plan as appropriate information becomes available, and continue participating in multijurisdictional disaster planning.

6-P.37 Promote public awareness of possible natural and man-made hazards, measures that can be taken to protect lives and property, response plans, and evacuation routes.

6-P.38 Inform the public and contractors of the danger involved and the necessary precautions that must be taken when working on or near pipelines or utility transmission lines.

6-P.39 Ensure all new development complies with all applicable regulations regarding the provision of public utilities and facilities.